SIX NEW SPECIES OF *SPHAGNUM* (BRYOPHYTA: SPHAGNACEAE) FROM NORTH AMERICA

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ABSTRACT

Sphagnum mcqueenii, S. kenaiense, S. bergianum, S. beothuk, S. sitchense, and **S. talbotianum**, are described and illustrated as new species for North America.

RESUMEN

Se describen se ilustran como especies nuevas de Norte América, **Sphagnum mcqueenii, S. kenaiense, S. bergianum, S. beothuk, S. sitchense,** y **S. talbotianum.**

INTRODUCTION

Extensive field work in North America in recent years has revealed a number of new species of *Sphagnum*, mostly in more remote and poorly collected areas. Six of those species are described in this paper. Four are from Alaska, one from Newfoundland, one from both Newfoundland and Alaska and a sixth species from several states and Canadian provinces in northeastern North America.

Sphagnum mcqueenii Andrus, sp. nov. (**Figs. 1–6**). TYPE: U.S.A. NEW HAMPSHIRE: Monroe Co.: Town of Nottingham, Pawtuckaway State Park, Dead Pond, extensive poor fen, 18 Sep 1994, *Andrus 9070* (HOLOTYPE: DUKE; ISOTYPES: BING, NY). *Sphagnum* sect. *Cuspidata*.

Planta staturam mediam attingens, flava vel brunnescens, capitulum apicem planumevolventi, gemma terminali praedito. Cortex caulinus e 1–2 stratis cellularum subdistinctarum tenuibus parietibus praeditarium compositus. Folia caulina aequilaterali-triangularia, 0.75–1.0 mm lata, 0.8–1.1 mm longa, late marginata, in regione apicali efibrillosa vel fibrillosa, plerumque in parte media superna in superficie concave poris vel in membranis hiatibus praedita, cellulis hyalinis plerumque in dimidio inferiore septatis, apice plusminusve obtuso. Folia ramulina ovato-lanceola, 0.5–0.85 mm lata, 1.6–2.1 mm longa, in superficie convexa cellulis hyalinus poros apicales 0–1 et plerumque pseudopores habentibus, in concave in angulis cellularum et interdum commissuras seus poris rotundis usque ad 12, 4–8 µm diametro praedita.

Plants robust and weak-stemmed; yellow to light brown; capitulum typically flat- topped and with a ± conspicuous terminal bud. **Stems** light green; cortex in 1–2 layers of moderately differentiated thin-walled cells. **Stem leaves** equilateral- triangular, 0.75–1.0 mm wide by 0.8–1.1mm long, usually spreading, apex obtuse, hyaline cells usually septate in lower half of leaf and efibrillose (or fibrillose near apex). **Branches** unranked, ± straight, branch leaves moderately elongated at distal end. **Branch leaves** ≤ 2.1 mm long, ovate-lanceolate, undulate and sharply recurved when dry; hyaline cells on convex surface with 0–1 apical pores and often with pseudopores, concave surface with up to 12 round wall-thinnings in cell angles and sometimes along commissures; chlorophyllose cells triangular in transverse section and just enclosed on the concave surface. **Sexuality** unknown.

Distribution.—Western Hemisphere Atlantic; known to date from Maine, New Hamp-

Fig. 1. *Sphagnum mcqueenii*. Habit.

FIG. 2. *Sphagnum mcqueenii*. Spreading branch.

shire, Pennsylvania, and Vermont from the U.S.A. and Nova Scotia and Newfoundland in Canada.

Identification.—*Sphagnum mcqueenii* can be separated from *S. cuspidatum* Hoffm. by its enclosed chlorophyll cells, obtuse stem leaves and the relatively short, recurved and broad (width : length ratio > 0.3) branch leaves. *Sphagnum viride Flatberg.* will differ in having branch leaf chlorophyll cells not reaching the concave surface and pointed stem leaves. Both *S. cuspidatum* and *S. viride* are also smaller and slenderer plants. *S. pulchrum* (Braith.) Warnst. has strongly 5-ranked branch leaves, more pointed stem leaves and more well-enclosed branch leaf chlorophyll cells. Wet-growing forms of *S. pulchrum* will also not have branch leaves elongated at the distal end of the branches, a characteristic of the more "aquatic" Cuspidata species. The other "aquatic" Cuspidata with which *S. mcqueenii* can occur are *S. torreyanum* Sull.and *S. atlanticum* Andrus. Both of these are larger plants and have longer branch leaves (> 2.1 mm). They also have stem leaves more appressed to the stem than *S. mcqueenii*, in which the stem leaves are often spreading.

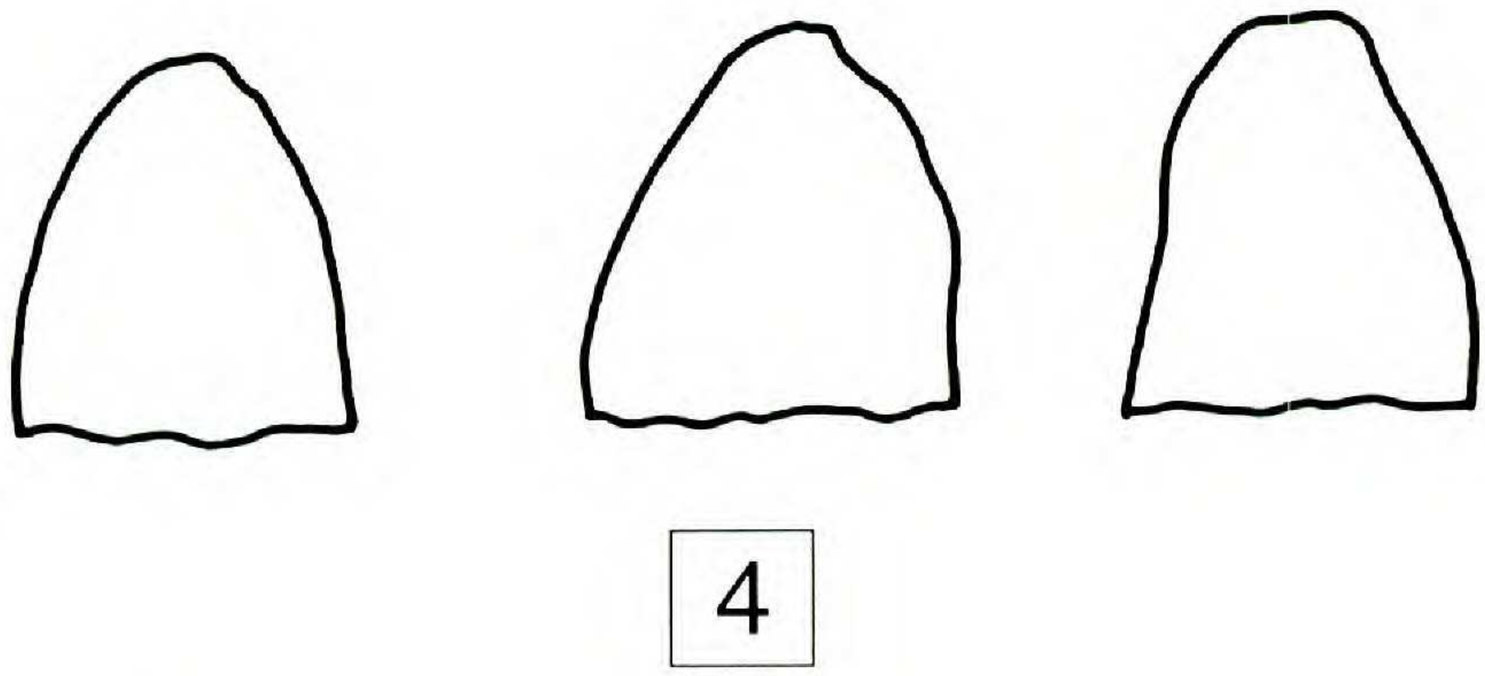
Ecology.—Habitat preferences not well known but it has so far been collected in poor fen habitats with floating mats, wet carpets and wet peaty depressions. It was quite abundant in the New Hampshire type locality, where it occurred in the moat at the bog margin associated with *S. torreyanum*, *S. atlanticum*, *S. cuspidatum* and *S. flexuosum* Dozy. & Molk.

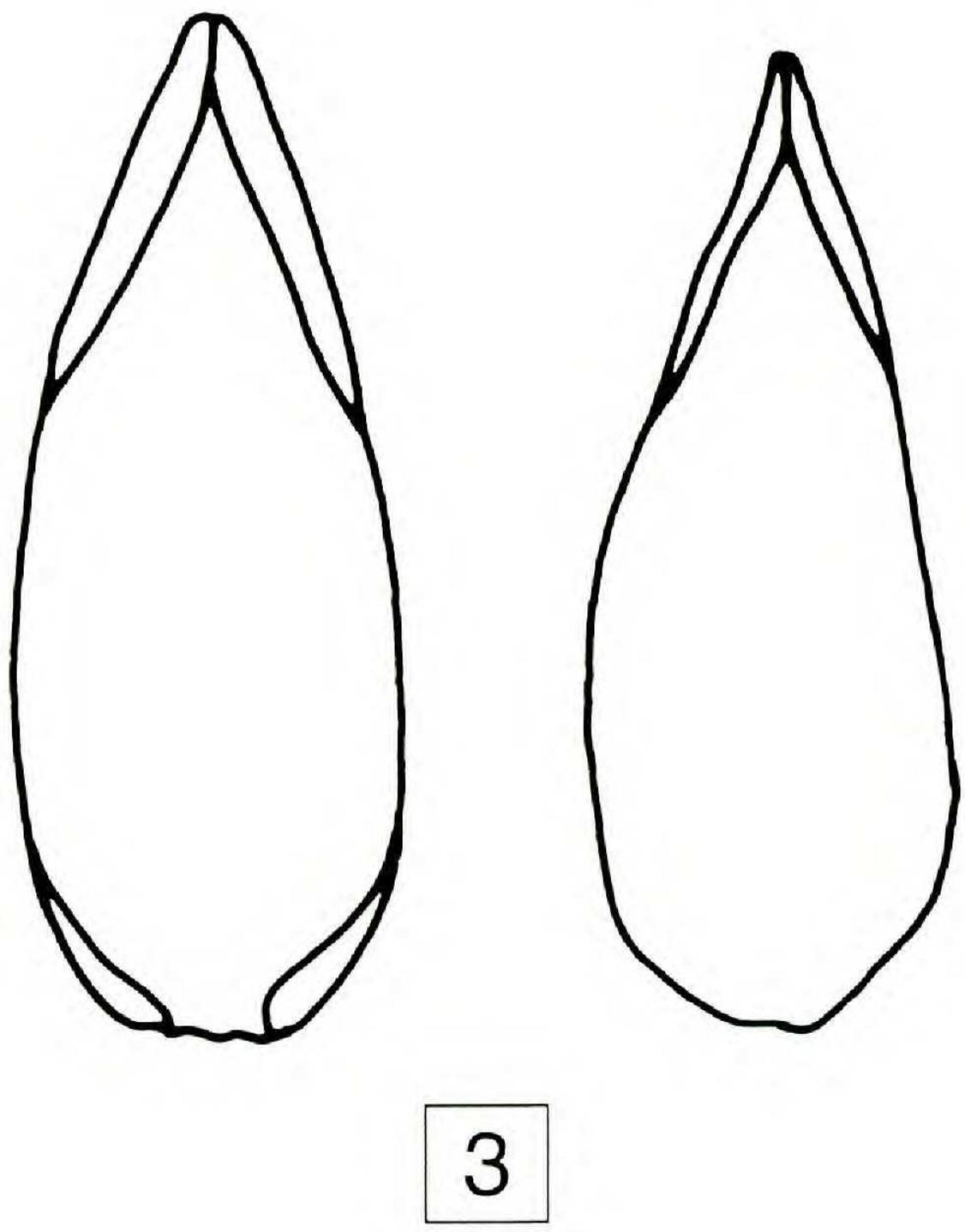
Etymology.—The namesake of this species is the late Cyrus McQueen, a good friend and fellow sphagnophile, who led me to the type locality.

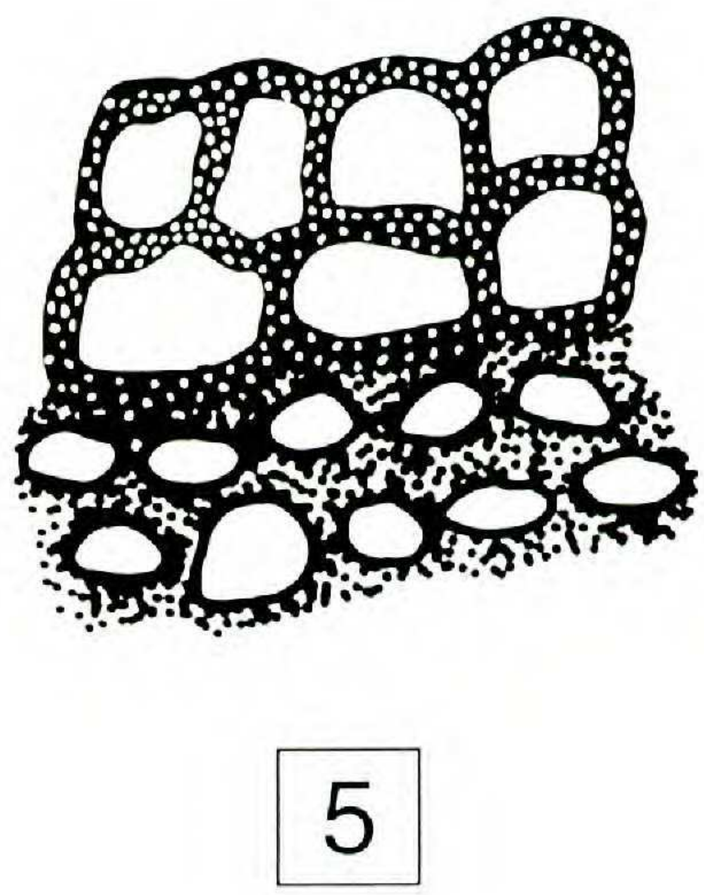
Additional collections examined: **CANADA. Newfoundland:** N of Pouch Cove, *Andrus 10309* (BING); Winterland, *Andrus 10422, 10423, 10439* (BING, DUKE); N of Harbour Breton, *Andrus 10632* (BING); Lark Harbour, *Andrus 10683* (BING, DUKE). **NOVA SCOTIA. Guysborough Co.:** *Schofield & Maass 3315* (DUKE). **U.S.A. MAINE:** Acadia National Park, *Little 16* (BING). **Sagahadoc Co.:** *Allen 27060* (DUKE). **PENNSYLVANIA. Monroe Co.:** *Andrus & Damman 6641* (BING). **VERMONT. Windham Co.:** *McQueen s.n.*, 19 Nov 1998 (BING, DUKE).

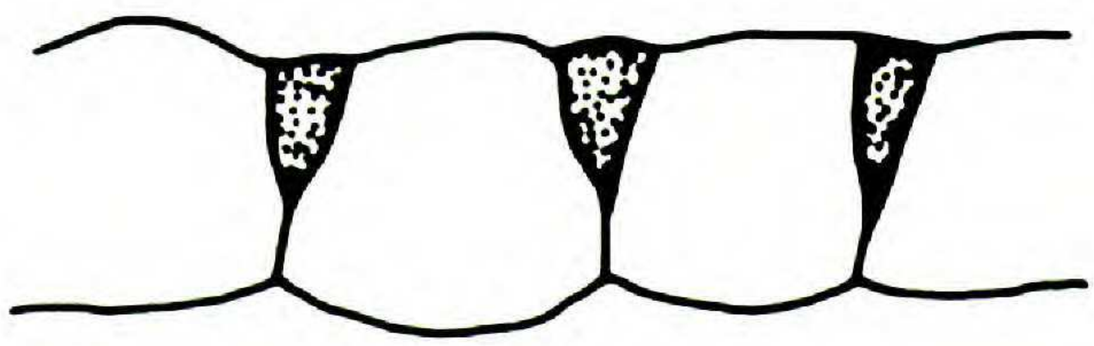
Sphagnum kenaiense Andrus, sp. nov. (**Figs. 7–12**). TYPE: U.S.A. ALASKA. Kenai Peninsula Co.: Kenai Peninsula, Soldotna, Headquarters Lake large poor fen complex surrounding lake, 17 Aug 2004 (HOLOTYPE: DUKE; ISOTYPES: BING, NY). *Sphagnum* sect. *Cuspidata*.

Planta parva caule debili, pallide brunnea vel aetate aurea, capitulo plano; cortex caulinus parietibus tenuibus, tantum leniter dilatatus. Folia caulina ad caulem appressa, lingulata, ovato-lingulata vel triangulata, aequa vel minora quam 0.9 mm longa, apice obtuso atque saepe eroso vel lacerato. Rami tantum leniter 5-ordinati vel 5-seriata, in apice distali rameali vix elongati. Fasciculus ramulinus e ramulis 2 patentibus atque 2–3 pendentibus compositus. Folia ramulina 1.1–1.3 mm longa, ovata, rigentia, in statu sicco leniter undulata atque subrecurva,









FIGS. 3–6. *Sphagnum mcqueenii*. **3.** Branch leaves. **4.** Stem leaves. **5.** Stem cortex cross section. **6.** Branch leaf cross section.

cellulis hyalinis in parte mediana perbrevibus atque latis (ratione arithmetica latitudinis usque longitudinis 0.3–0.4) et in superficie convexa in parte folii inferiore saepe apicaliter poro magno atque/usque 6 poris liberis et parte apicali saepe margines cellulares secus peudoporis instructa, in superficie concava ad terminos cellulares atque angulos areis parietum tenuium magnis rotundis interdum inconspicuuis vel nullis praedita; cellulae chlorophylligerae in section transversali triangulares, typice in superficie bene inclusae.

Plants small.and weak-stemmed; pale brown to golden brown; capitulum flat-topped and

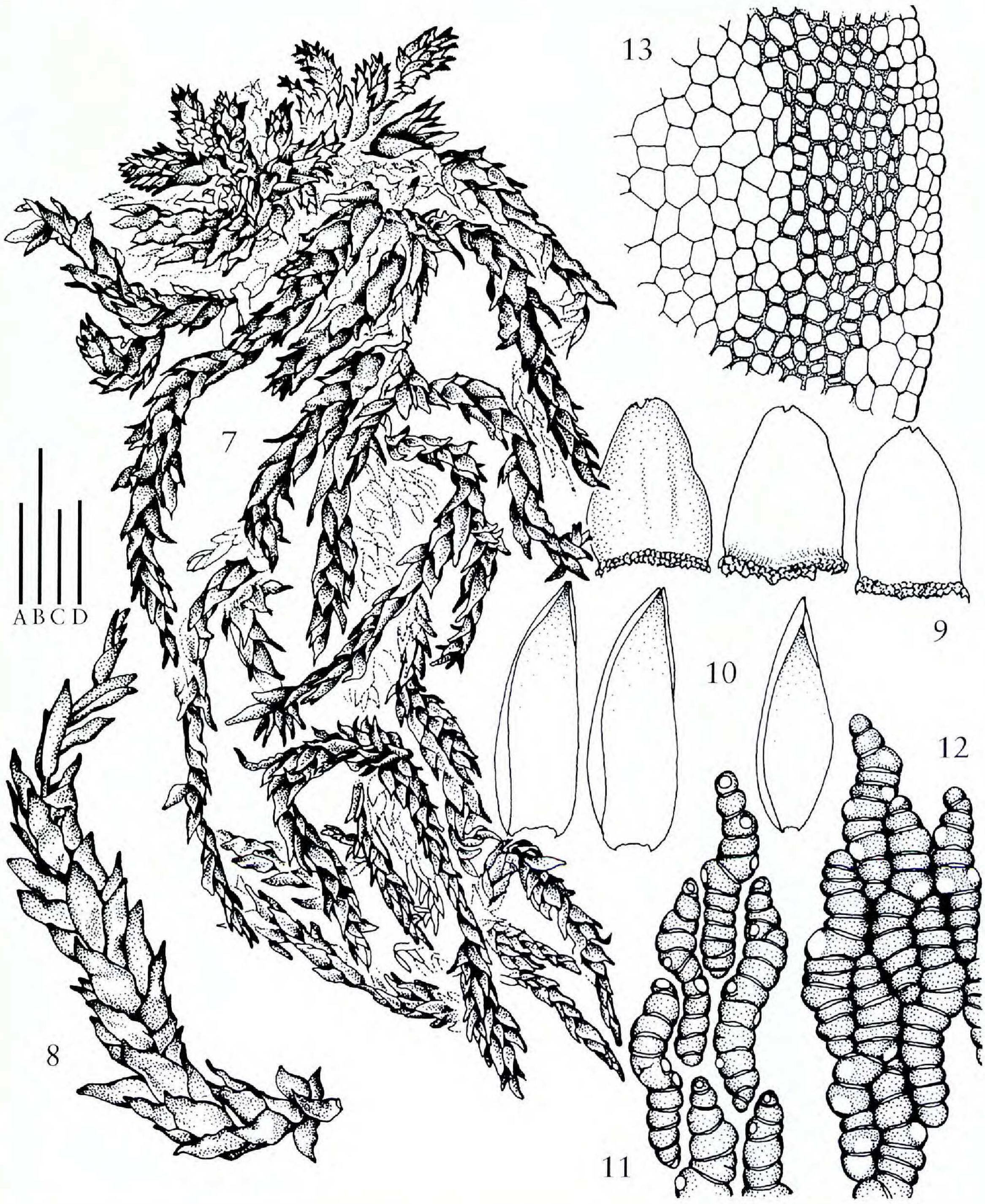


Fig. 7–13. *Sphagnum kenaiense*. **7.** Habit. **8.** Branch. **9.** Stem leaves. **10.** Branch leaves. **11.** Branch leaf convex surface. **12.** Branch leaf concave surface. **13.** Stem section. Scale bars: A = 2 mm, 7; B = 2 mm, 8; C = 0.5 mm, 9–10; D = 50 µm, 11–13.

only weakly 5-radiate. **Stems** pale yellow; stem cortex moderately well-differentiated but not much enlarged. **Stem leaves** appressed to stem; lingulate, ovate,to triangular; equal to or less than 0.9 mm long; apex obtuse and often erose to lacerate. **Branches** with leaves unranked to 5-ranked, leaves not much elongated at distal branch tip. **Branch fascicles** with 2 spreading and 2–3 pendent branches. **Branch leaves** ovate, 1.1–1.3 mm long, stiff,

weakly undulate and slightly recurved when dry; hyaline cells in mid-region quite short and broad (width:length = 0.3–0.4), in lower 1/2 of leaf on convex surface often with 1 large pore apically and/or up to 6 free pores, in apical region often with pseudopores along the cell margins; on concave surface with large round wall-thinnings in the cell ends and angles (these sometimes faint or absent); chlorophyllose cells triangular in transverse section and typically well-enclosed on concave surface. **Sexuality** unknown.

Distribution.—South-Central and Western Alaska.

Identification.—Within its range, *S. kenaiense* may be confused with *S. angustifolium* (Russow) C. Jens., *S. balticum* (Russow) C. Jens.) and *S. brevifolium* (Braithw.) Roell. *Sphagnum angustifolium* in the field has narrower ovate-lanceolate branch leaves. Microscopically *S. angustifolium* has a poorly differentiated stem cortex, chlorophyll cells not well-enclosed and narrower branch leaf hyaline cells. *Sphagnum balticum* has narrower branch leaves and typically only one hanging branch, with stem leaves markedly spreading. Microscopically the branch leaf hyaline cells are also narrower. *Sphagnum brevifolium* has stem leaves that are apiculate to acute and ovate-lanceolate branch leaves. It also has narrower hyaline cells in its branch leaves than *S. kenaiense*.

Ecology.—*Sphagnum kenaiense* occurs in poor to medium fens, often of a sedge dominated nature. It typically forms sprawling patches in hollows, often over bare peat.

Etymology.—The species epithet *kenaiense* is after the Kenai Peninsula where the species was found.

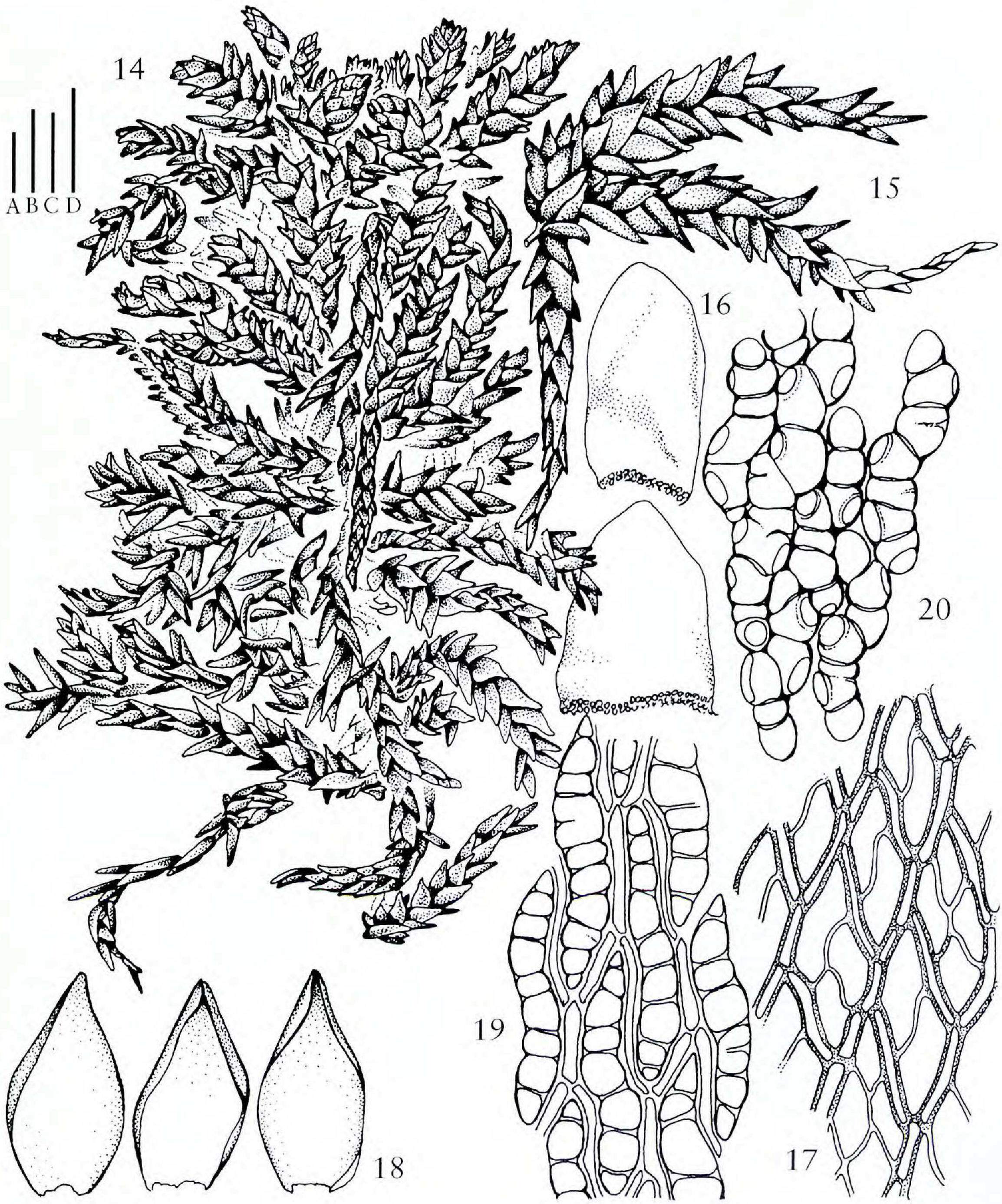
Additional collections examined: **U.S.A. ALASKA:** King Salmon, *Andrus 9306* (BING, DUKE); Selawik, *Schofield 121,733* (BING); Anchorage, Campbell Airstrip fen, *Andrus 8448* (BING, DUKE); Kenai Peninsula, Milepost 100 on Seward Hwy., *Andrus 8752* (BING, DUKE, NY).

Sphagnum bergianum Andrus, sp. nov. (**Figs. 13–19**). TYPE: U.S.A. ALASKA. Kenai Peninsula Co: Kenai Peninsula, Soldotna, Headquarters Lake, extensive poor fen complex at lake margin, 17 Aug 2004, *Andrus 10020* (HOLOTYPE: DUKE; ISOTYPES: BING, NY). *Sphagnum* section *Acutifolia*.

Planta quoad staturam mediocris vel robusta, capitulo plus minusve in apice plano magnoque, omnino atro-fusco, centro capituli aurato, in statu vivo saturate rubritingenti, in statu sicco nitore roseolo-purpurascenti praedito.Caulis atro-fuscus, cellulis corticalibus superficialibus eporosis. Folia caulina late triangulari-lingulata, 1.15–1.25 × 0.8, in apice subobtusa vel late obtusa, limbo ad basem modice dilatato, cellulis hyalinis pro parte maxima 1-septatis, paucis vel multis in parte mediana 2-septatis,rhombiformibus. Rami plus minusve 5-ordinati. Fasciculus ramulinus e ramulis 2 patentibus atque 1 pendenti. Folia ramulina 1.2–1.3 × 0.65–0.75 mm, late ovata, apice involuta, cellulis hyalinis in superficie convexa numerosis rotundatis vel ellipticis poris commissuras secus instructis, in apice poris parvis gradatim usque ad basem maioribus, superficie concave eporosa, poris paucis magnis in partibus distalibus lateralibusque exceptis. Status sexualis dioicus. Sporae 26–30 µm.

Plants moderate-sized to robust, capitulum more or less flat-topped and large; dark brown overall with a golden center to the capitulum and a distinctive deep red tinge in the field which becomes a pinkish-purple sheen upon drying. **Stems** dark brown; superficial cortical cells aporose. **Stem leaves** broadly triangular-lingulate, 1.15–1.25 × 0.8, apex slightly to broadly obtuse, border moderately broadened at base; hyaline cells mostly 1-septate with a few to many 2 septate in the mid-region, shape rhomboidal. **Branches** more or less 5 ranked. **Branch fascicles** with 2 spreading and 1 hanging branch. **Branch leaves** 1.2–1.3 mm × 0.65–0.75, broadly ovate, apex involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, these grading from small pores at the apex to large pores at the base; concave surface aporose except for a few large pores in the lower side regions. **Sexual condition** dioicous. **Spores** 26–30 µm.

Distribution.—Newfoundland and South-central Alaska.



FIGS. 14–20. *Sphagnum bergianum*. **14.** Habit. **15.** Branch fascicle. **16.** Stem leaves. **17.** Stem leaf hyaline cells. **18.** Branch leaves. **19.** Branch leaf, concave surface. **20.** Branch leaf convex surface. A = 2 mm, 14; B = 2 mm, 15; C = 0.5 mm, 16, 18; D = 50 µm, 17, 19–20.

Identification.—*Sphagnum bergianum* seems most clearly related to *S. subfulvum* Sjoers sensu lato, as described by Flatberg (1985). Both *S. subfulvum* and *S. subfulvum ssp purpureum* Flatb. are a lighter golden-brown than the quite dark brown of *S. bergianum*. Furthermore, both of these taxa have narrower stem leaves that are more acute at their apex. And neither of these taxa have distinctly 5-ranked branch leaves like *S. bergianum*. *Sphagnum bergianum* is a quite unusual looking species in the field, with its very dark brown color tinged with a deep red color. When dry this deep red becomes more purplish

but it still shows some red. This distinctive field appearance made it quite recognizable when collected in Newfoundland in 2005.

Table 1 highlights the differences between *S. bergianum* and other larger brown *Acutifolia*. Because of its similarity, *S. subfulvum* ssp *purpureum* is included for completeness even though the author has not seen any North American specimens of that taxon and believes it to be of doubtful occurrence there.

Ecology.—In the few sites where it has so far been collected, *S. bergianum* has been a hummock forming species of medium fen habitats, associated with such species as *S. warnstorfii* Warnst., *S. subfulvum*, *S. platyphyllum* (Braithw.) Warnst. and *S. fuscum* (Schimp.) H. Klinggr.

Etymology.—This species named after Ed Berg, ecologist with the US Fish and Wildlife Service, who first found this species in Headquarters Lake next to his office.

Additional collections examined: **CANADA. Newfoundland:** 9 km N of Badger, *Andrus 10646* (BING, DUKE, NY); 15 km SW of Corner Brook, *Andrus 10667* (BING, DUKE, NY). **U.S.A. Alaska:** Kenai Peninsula, Milepost 40 on Seward Hwy., *Andrus 10036* (BING, DUKE, NY).

Sphagnum beothuk Andrus, sp. nov. (**Figs. 20–25**). TYPE: CANADA. NEWFOUNDLAND: Lark Harbour, ca. 50 km NW of Corner Brook, medium rich fen, 20 m elev., *Andrus 10687* (HOLOTYPE: DUKE; ISOTYPE: BING, NY). *Sphagnum* sect. *Acutifolia*.

Planta parva vel quoad staturam mediocris, capitulo rotundato densoque atro-fusco nitore purpurascenti praedito. Caulis brunneus, cellulis corticalis superficialius eporosis. Folia caulina lingulata, 1.1–1.2 mm longa, in apice subapiculata vel maximam partem lata, erosaque vel lacerata, limbo ad basem tantem parce dilatato, cellulis hyalinis rhombiformibus, 0–1-septatis. Rami plus minusve 5-ordinati. Fasciculus ramulinus e ramulis 2 patentibus atque 1 pendenti compositus. Folia ramulina 0.95–1.3 mm longa, ovata vel ovato-lanceolata, concava, stricta vel parce subsecunda, in apice involuta, cellulis hyalinis in superficie convexa poris commissuras secus numerosis rotundatis vel ellipticis instructis, ad basem poris magnis gradatim usque ad apicem miscellaneam e poris minutis vel perpusillis (2 _m, minoribus quam 0.25 partes latitudinis cellularum) compositam formantibus, superficie concava in partibus proximalibus lateralibusque poris parcis, rotundatis per cellulam instructa. Status sexualis ignotu.

Plants small to moderate-sized; capitulum rounded and dense; dark brown with a purplish sheen. **Stem** brown, superficial cortical cells aporose. **Stem leaves** lingulate, 1.1–1.2 mm long, apex slightly apiculate to mostly broad and erose to lacerate, border only slightly broadened at base; hyaline cells rhomboidal and 0–1 septate. **Branches** more or less 5-ranked. **Branch fascicles** with 2 spreading and 1 pendent branch. **Branch leaves** 0.95–1.3 mm long, ovate to ovate-lanceolate, concave, straight to slightly subsecund, apex involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, grading from large pores at the base to a mixture of small and tiny (2 µm, less than 0.25 cell width) at the apex, concave surfacewith a few large, round pores/cell in lower side regions. **Sexual condition** unknown.

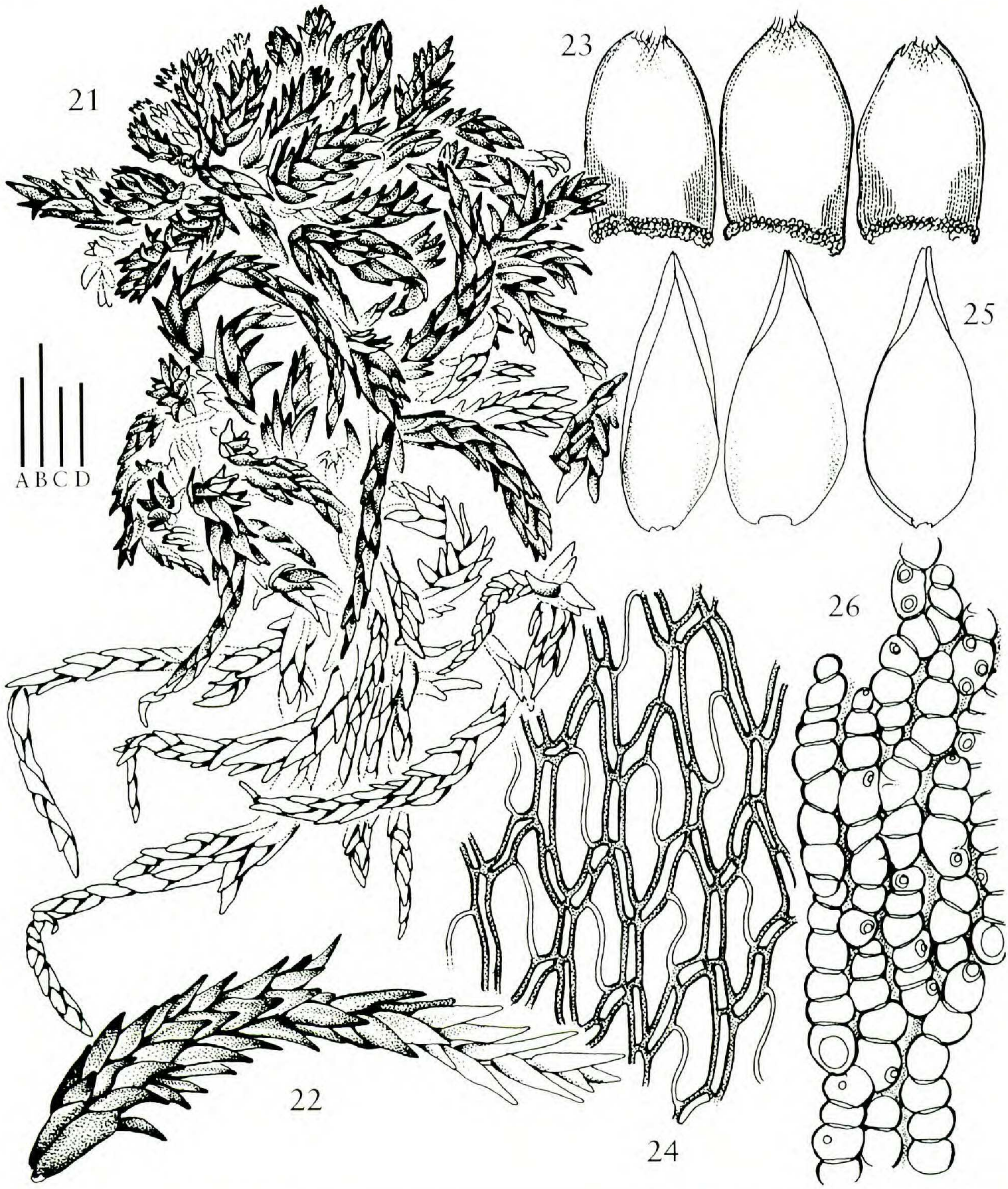
Distribution.—Known only from Newfoundland, Canada.

Identification.—In the field *S. beothuk* looks like a very dark form of *S. fuscum* except for its distinct purplish sheen. It's rather more robust than *S. fuscum* and also has 5-ranked branch leaves, which *S. fuscum* usually lacks. Microscopically, however, *S. beothuk* differs clearly in the tiny pores seen mixed in with more typical pores on the convex surface of the branch leaf at the apex. Among the known *Acutifolia* species, only the red pigmented *S. warnstorfii* has been noted with this character before.

Ecology.—*Sphagnum beothuk* forms dense hummocks similar to *S. fuscum*. It appears to be a minerotrophic species and has been collected in the same mire as *S. subfulvum*, *S. inundatum* Russow, and *S. warnstorfii*.

TABLE 1. Comparison of *Sphagnum bergianum* and related species.

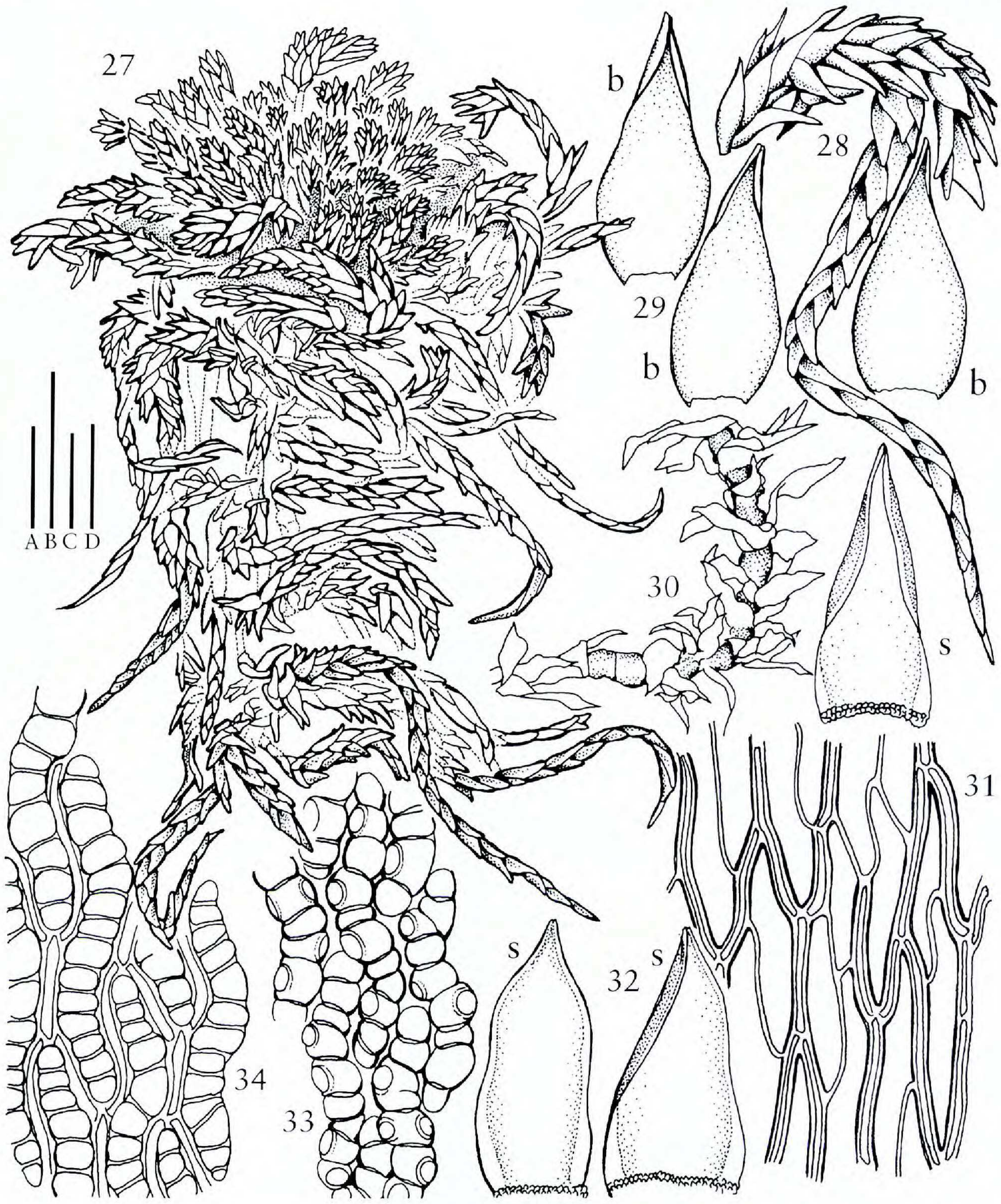
Characteristic	*S. bergianum*	*S. subfulvum*	*S. subfulvum* ssp. *purpureum*	*S. subnitens*	*S. flavicomans*
Color	Dark brown with a deep red tinge	Golden-brown with a purplish gloss sometimes	Golden-brown with red tinge	Reddish-purple mixed with golden brown	Brown
Branch fascicles, spreading + hanging branches	2 + 1	2 + 1–2	2 + 1–2	2 + 1–2	2 + 1–2
Branch leaf ranking	Often 5 -ranked	Unranked	Unranked	Unranked	Often 5-ranked
Branch leaf shape	Broadly ovate	Ovate	Ovate	Ovate to ovate-lanceolate	Ovate-lanceolate
Stem leaf shape	Triangular-lingulate	Triangular-lingulate to broadly lingulate	Triangular-lingulate	Triangular to triangular-lingulate	Narrowly triangular-lingulate
Stem leaf apex	More or less obtuse	More or less acute	More or less acute	Acute to apiculate	Acute to apiculate
Stem leaf length in mm	1.15–1.25	0.9–1.3	1.3–1.4	1.3–2.7	1.5–2.0
Stem leaf hyaline cells	1–2 septate	0–1 septate	0–1 septate	0–1 septate	0–1 septate
Distribution	Newfoundland & SC Alaska	NE and NW North America	NW Europe	Eurasia, W North America & New Zealand	NE North America



FIGS. 21–26. *Sphagnum beothuk*. **21.** Habit. **22.** Branch. **23.** Stem leaves. **24.** Stem leaf hyaline cells. **25.** Branch leaves. **26.** Branch leaf hyaline cells, convex surface. A = 2 mm, 21; B = 1 mm, 22; C = 0.5 mm, 23, 25; D = 30 µm, 24, 26.

Etymology.—The Beothuk are the aboriginal people of Newfoundland.

Comments.—Several things suggest a possible hybrid origin between *S. fuscum* and *S. warnstorfii*. The tiny pores at the branch leaf tips, the purplish sheen and the 5-ranked branch leaves suggest *S. warnstorfii* and the lingulate stem leaves are a character of *S. fuscum*. Furthermore the type locality is a minerotrophic site in which both *S. fuscum* and *S. warnstorfi* also occur.



FIGS. 27–34. *Sphagnum sitchense.* **27.** Habit. **28.** Branch. **29.** Branch leaves ("b"). **30.** Stem with leaves. **31.** Stem leaf hyaline cells. **32.** Stem leaves ("s"). **33.** Branch leaf, convex surface. **34.** Branch leaf, concave surface. A = 2 mm, 27; B = 1 mm, 28, 30; C = 0.5 mm, 29, 32; D = 50 µm, 31, 33, 34.

Additional collections examined: **CANADA. Newfoundland:** Lark Harbour, *Andrus 10685, 10686, 10687* (TOPOTYPES: BING, DUKE); ca. 16 km S of jct. of Hwy 210 and Hwy 214, *Andrus 10408* (BING, DUKE).

Sphagnum sitchense Andrus, sp. nov. (**Figs. 26–33**). TYPE: U.S.A. ALASKA: Sitka Co.: Sitka, Harbor Mt., alpine area at end of road, 700 m elev., dense patch in tundra, 19 Aug 2004, *Andrus 10097* (HOLOTYPE: DUKE; ISOTYPES: BING, NY). *Sphagnum* sect. *Acutifolia.*

Planta quoad staturam parca, capitulo in apice plano, denso, luteolo atque roseolo, nitore destituto. Caulis roseolus, cellulis corticalibus superficialibus eporosis. Folia caulina anguste triangularia vel lingulato-triangularis, 1.2–1.6 mm longa × 0.6–0.8 mm lata, ratione arithmetica longitudinis usque latitudinis ca. 2:1, apice apiculato, limbo valde distincto basaliter modice dilatato, cellulis hyalinis anguste rhomboidalibus interdum 2-septatis, saepe in apice fibrillosis. Rami non 5-ordinati. Fasciculus ramulinus e ramulis 2 patentibus atque 1 pendenti compositus. Folia ramulina 1.3–1.5 mm longa, 0.5–0.55 mm lata, ovato-lanceolata, concava, stricta, in apice involuta; cellulae hyalinae in superficie convexa commissuras secus poris numerosis rotundis vel ellipticis ad basem poris magnis ellipticis gradatim usque ad apicem rotundatis quoad staturam mediocribus, in superficie concava poris magnis rotundatis paucis omnino adspersis. Status sexualis ignotus.

Plants moderate-sized; capitulum flat-topped and dense; pale yellow and pink, lacking sheen. **Stem** pink, superficial cortical cells aporose. **Stem leaves** narrowly triangular to lingulate- triangular, 1.2–1.6 mm long × 0.6–0.8 mm wide, length:width ratio ca 2:1,apex apiculate, border strong and moderately broadened basally; hyaline cells narrowly rhomboidal and 1 to occasionally 2 septate, often fibrillose apically. **Branches** not 5-ranked. Branch fascicles with 2 spreading and 1 pendent branch. **Branch leaves** 1.3–1.5 mm long and 0.5–0.55mm wide, ovate-lanceolate, concave, straight, apex involute; hyaline cells on convex surface with numerous round to elliptic pores along the commissures, grading from large elliptical pores at the base to moderate-sized round pores at the apex, concave surface with a few large round pores scattered throughout. **Sexual condition** unknown.

Distribution.—Known only from the type locality in southeast Alaska but since alpine areas in this area are poorly collected it is likely more widespread.

Identification.—*Sphagnum sitchense* is somewhat similar to *S. capillifolium* (Ehrh.) Hedw. But differs in a number of important ways. Its stem leaves are often narrowly triangular whereas those of *S. capillifolium* are lingulate- triangular. Branch fascicles on *S. sitchense* have 2 spreading and one hanging branch whereas those of *S. capillifolium* have 2 spreading and mostly 2 hanging branches. The stem leaf hyaline cells in *S. sitchense* are 1–2 septate while those on *S. capillifolium* are 0–1 septate. In the field *S. sitchense* has a pale red tinge and quite flat topped capitulum which contrast with the deeper red tinge and rounded capitulum of *S. capillifoilum*.

Sphagnum sitchense also bears some resemblance to *Sphagnum subnitens* but differs in the following ways. *Sphagnum sitchense* has a strongly bordered stem leaf with a few 2 septate hyaline cells while *S. subnitens* has a narrow border and hyaline cells 0–1 septate only. *Sphagnum sitchense* also lacks the metallic sheen and brown coloration that are typical of *S. subnitens*. And lastly, the branch fascicles in *S. sitchense* have only one hanging branch whereas *S. subnitens* has mostly two.

The stem leaves of *S. sitchense* are quite similar to those of *S. quinquefarium*, with which it occurred in the type locality, but the latter species has 5-ranked branch leaves and typically 3 spreading branches per fascicle.

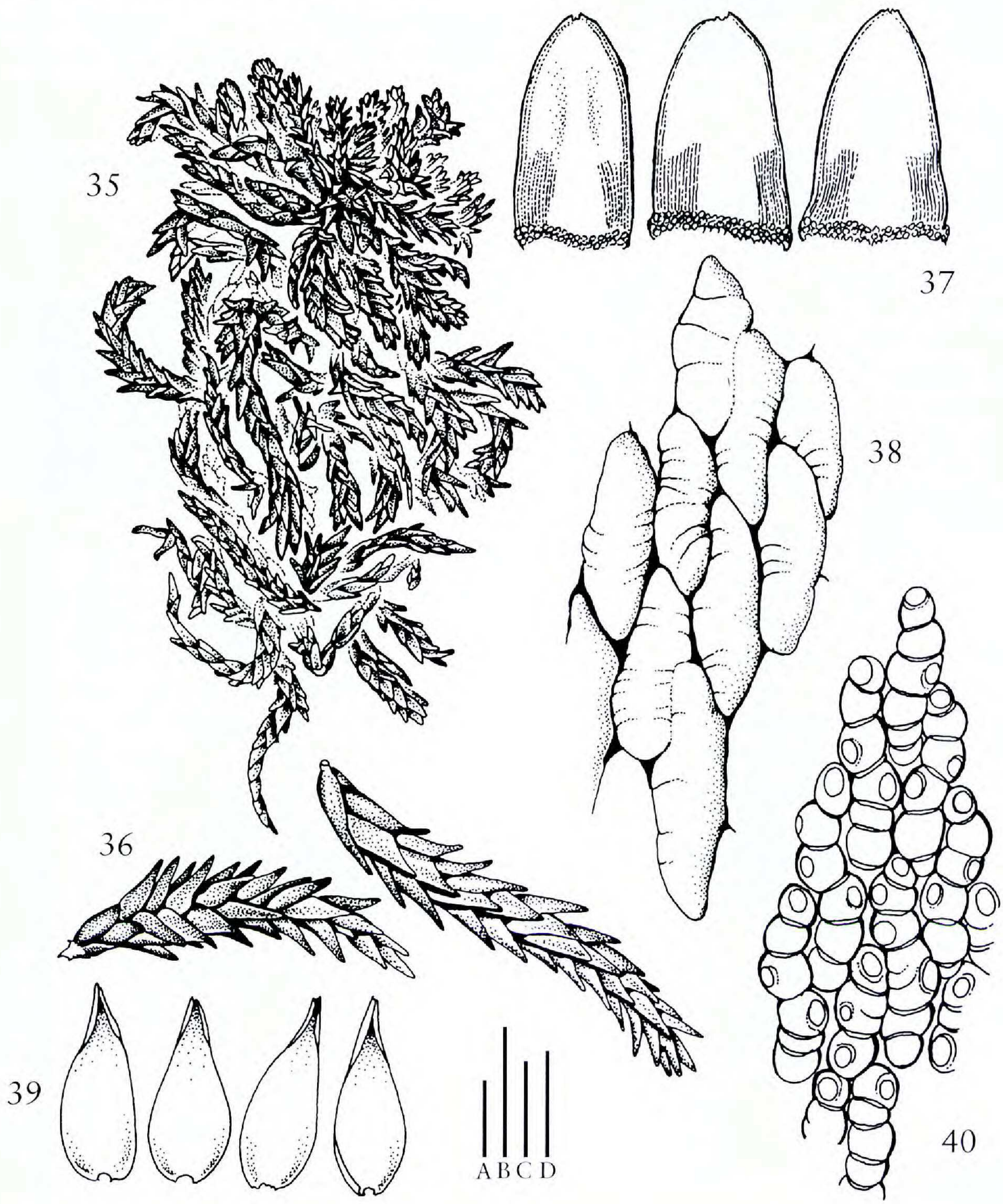
Ecology.—In the type locality, *S. sitchense* was collected several times in dense patches in the tundra. Growing similarly in the same area were *S. girgensohnii* Russow, *S. quinquefarium* (Braithw.) Warnst., and *S. compactum* D.C.

Etymology.—*Sphagnum sitchense* is after the type locality.

Additional collections examined: **U.S.A. Alaska:** Sitka, Harbor Mt,. *Andrus 10095, 10098* (BING).

Sphagnum talbotianum Andrus, sp. nov. (**Figs. 34–39**). TYPE: U.S.A. ALASKA: Bethel Co.: Bethel, 0.9 mi down BIA Rd. by turnoff for Chief Eddie Hoffman Hwy, just W of Larson Subdivision, medium fen, *Andrus 9526* (HOLOTYPE: DUKE; ISOTYPES: BING, NY, TRH). *Sphagnum* sect. *Acutifolia*.

Planta rubri-pigmentifera, capitulo in apice complanato, subdenso. Cortex caulinus eporosus. Folia caulina



FIGS. 35–40. *Sphagnum talbotianum*. **35.** Habit. **36.** Two branches. **37.** Stem leaves. **38.** Stem leaf hyaline cells. **39.** Branch leaves. **40.** Branch leaf, convex surface. A = 2 mm, 35; B = 2 mm, 36; C = 0.5 mm, 37, 39; D = 30 µm, 38, 40.

lingulato-triangularia vel lingulata, in apice plusminusve obtusa, 0.8–1.05 mm longa, 0–0.55 mm lata, limbo ad basem valde distincto, cellulis hyalinis rhombiformibus, 0–1 septatis,et fibrillis et poris carentibus. Folia ramulina stricta et ovato-lanceolata, 1.0–1.2 mm longa, 0.3–0.35 mm lata, quinqueordinata, laxe patentia; cellulae in superficie convexa poris quoad amplitudinem mediocribus, in apice 4–6 µm usque in base minoribus quam 20 µm, in superficie concava eporosae praeter interdum in partibus lateralibus infernis poris magnis rotundatis praeditae. Status sexualis ignotis.

Plants pink-colored; capitulum flat-topped and moderately dense. **Stem** red-tinged, cortex eporose. **Stem leaves** triangular-lingulate to lingulate with a more or less obtuse apex,

0.8–1.05 mm. long × 0.5–0.55 mm. wide; border strongly developed at the base; hyaline cells rhomboidal and 0–1 septate, efibrillose and eporose. **Branches** with leaves 5-ranked and loosely spreading. **Branch leaves** small, 1,0–1.2 mm. long × 0.3–0.35 mm. wide; convex surface with moderate- sized pores, grading from 4–6 µm near apex to more than 20 µm at base, concave surface eporose except for occasional large round pores in proximal side regions. **Sexual condition** unknown.

Distribution.—Western Alaska. Currently known from Bethel, King Salmon, and Koyukuk National Wildlife Refuge.

Identification.—As far as other red *Acutifolia* within its general range, *S. talbotianum* is most similar to *S. rubellum* Wils. and *S. warnstorfii*. *Sphagnum rubellum* has a lingulate stem leaf with at least some hyaline cells 2-septate whereas *S. talbotianum* has stem leaves that are often triangular-lingulate and with hyaline cells that are 0–1 septate. The branch leaves on *S. rubellum* are also often subsecund while those of *S. talbotianum* are straight. *Sphagnum warnstorfii* looks quite similar macroscopically but has much smaller ringed pores on the convex surface of the branch leaf tips.

Ecology.—Collections to date indicate this to be a quite widespread tundra species of minerotrophic peatlands. It typically forms low dense hummocks. Compared to *S.rubellum* Wils. and *S. warnstorfii* Russow, the other abundant red quinquefarious *Acutifolia* with which its range overlaps, *S. talbotianum* occurs in richer sites than *S. rubellum* and poorer sites than *S. warnstorfii*.. Common associated *Sphagna* include *S. lenense* Pohle. *S. squarrosum Crome, S. teres (Schimp.) Aongs., S. brevifolium (Braithw.) Warnst., S. arcticum* Flatberg & Frisvoll, *S. subsecundum* Nees, *S. perfoliatum* Savicz-Lubitskaya, *S. obtusum* Warnst., *S. alaskense* Andrus & Janssens, and *S. steerei* Andrus.

Etymology.—*Sphagnum talbotianum* honors Stephen Talbot, who has collected more *Sphagnum* in more remote areas of Alaska than any other botanist. He deserves more credit than anyone else for our current knowledge of the distribution of *Sphagnum* in that state.

Additional collections examined: **ALASKA:** Koyukuk National Wildlife Refuge, 21 Aug 1989, *Talbot & Talbot 8-8-16* (BING); Yukon Delta National Wildlife Refuge, Kuskokwim River Delta, (mixed with *S. lenense*) 15 Aug 2001, *Andrus 9465* (BING, DUKE, NY); King Salmon, near village, 5 Jul 2001, *Andrus 9522* (BING, DUKE, NY); King Salmon area, ca. 39 km SW on maritime tundra, 6 Aug 2001, *Andrus 9354* (BING, DUKE, NY).

REFERENCE

Flatberg, K.I. Studies in *Sphagnum subfulvum* Sjoers, and related morphotypes. Lindbergia 11:38–54.